SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA

Minor 1 (Even Semester) – 2018-19

Entry No: | | | | | | | | | |

Total number of pages:[1]
Total number of questions: 4

B.Tech. || MECHANICAL ENGG || Sem IV

Fluid Machines

Subject Code: MEL-2232

Time allowed: 1.5 Hrs **Max Marks: 20**

Important Instructions:

- All questions are compulsory
- Assume any missing data

PART A

Q. 1. Short-Answer Questions: **[1 x5=5]**

(a) What is a friction factor in case of impact of jets? How it effects the outlet velocity?

(b) Give the design considerations for eliminating the axial thrust in case of the Pelton wheel turbines.

(c) Why the buckets are not exactly semicircular in case of Pelton wheel turbine?

(d) Is it practically possible to get 100% efficiency in case the jet impinges on series of curved vanes mounted on the periphery of a wheel? If no, then give the reasons.

(e) Give the implications of Impulse momentum principle.

PART B

Q. 2. Prove that the maximum efficiency for a system with jet striking at the center of a moving semicircular vane is 59.2% **[5]**

Q. 3. A nozzle of 70 mm diameter delivers a stream of water that strikes a flat plate which is held normal to the axis of stream. If the issuing jet has a velocity of 24 m/s, make calculations for the **[5]**

a) Force exerted on the plate if held stationary.

b) Force exerted on the plate, work done per second and the jet efficiency if the plate moves in the direction of jet at 10 m/s.

c) Work done if the plate is replaced by a series of plates moving with a velocity of 16 m/s.

Q. 4. Prove that the force exerted by a jet striking at the center in case of the stationary curved vane is always greater than that of the case for a flat plate. Also find out the condition where this force is twice the force exerted for a flat plate held stationary in a direction perpendicular to the jet **[5]**